

REMARKS

Minor amendments have been made to the specification at page 1. No new matter has been added.

Claims 1 to 3, 5 to 12, 14, and 15 remain in the application and are presented, without amendment, for reconsideration by the Examiner.

The disclosed and claimed invention addresses a specific problem related to the use of portable radio terminals, such as data terminals which communicate with a company's computer network. Such portable radio terminals are used by business persons when visiting customers to obtain current prices and terms for their company's products to show to customers and to input order acceptance. The problem addressed by the claimed invention is that, when held by the user in his or her hand, the proximity of the user's hand or head can cause great deterioration of the antenna characteristics.

The claimed invention solves this problem with an improved portable terminal device having a plurality of antennas at disparate locations within the device housing. At least first and second antennas are used with the first antenna being located at one end of the housing the second antenna located at the other end of the housing. In the embodiments shown in Figures 1(A), 2(A) and 3(A), a unitary housing 1 is provided with a first antenna 2 at the lower end of the housing and a second antenna 3 at the upper end of the housing. In the embodiment shown in Figure 4, a foldable housing comprising an upper housing part 12 and a lower housing part 13 connected by a hinge 14. The first antenna 2 is located at the lower end of the lower housing, and the second antenna 3 is located at the upper end of the upper housing so that, when the housing is opened, the first and second antennas are located at opposite ends of the two housing parts.

The two antennas are connected to a radio unit 5 by a switch 7 so that one or the other of the two antennas is selectively connected to the radio unit for two-way communication. The switch 7 is controlled by a controller 6 which receives an input from a sensor 8. In practice, a plurality of sensors can be used, at least one of which is placed in proximity to one of the antennas. These sensors may be touch sensitive sensors, optical sensors or impedance change sensors. Thus, when

the user places his or hand in proximity with an antenna, this condition is sensed and the controller 6 causes the switch 7 to switch to the other antenna, thereby maintaining a good communication link at all times.

Claims 1, 3, 5, 7, and 8 were rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 6,678,532 to Mizoguchi in view of U.S. Patent No. 6,456,856 B1 to Werling et al. This rejection is respectfully traversed for the reason that the combination of Mizoguchi and Werling et al. does not teach, suggest or otherwise make obvious the claimed invention.

Mizoguchi discloses a portable phone having a detecting unit of contact of an antenna with the human body. When this condition is detected, a notice signal is generated to notify the user that they are contacting the antenna. The detection of this bodily contact is by detection of a decrease of an electric field intensity around the antenna, a change in a voltage of a reflected signal from the antenna, or an impedance change in the antenna circuit. In the embodiment shown in Figures 14 and 15, Mizoguchi adds a second antenna 11b, antenna 11a corresponding to antenna 11 in the embodiment shown in Figures 7 and 9.

“The first antenna 11a as the element used at the time of the transmission and reception is connected with either of the receiving circuit 22 and the transmitting circuit 23 through a first high frequency switch 24a and a second high frequency switch 24b.

“The second high frequency switch 24b has a contact to connect of the receive-only second antenna 11b with the receiving circuit 22 in case of the reception. The first high frequency switch 24a has a contact to connect the transmitting circuit 23 with the first antenna 11a in transmission, and a contact to connect the first antenna 11a with the receiving circuit 22 through the second high frequency switch 24b in case of the reception. The second high frequency switch 24b have the contact to connect the first antenna 11a with receiving circuit 22 through the first high frequency switch 24a in case of the reception.” (col. 9, line 61, to col. 10, line 9, emphasis added)

“A CPU and peripheral circuit 35 are connected with the receiving circuit 22. The CPU and peripheral circuit 35 operate based on a software and have the function to monitor and control the telephone circuit 21'. The speakers 12, the microphones 6, the vibrators 5, the green LED 8 for notifying, the red LED 9 for notifying as mentioned above are controlled by the CPU and

peripheral circuit 35.

“A transmission signal transmitted from a portable phone base station is received by the first antenna 11a or the second antenna 11b. The received signal by the first antenna 11a or the second antenna 11b is supplied to the receiving circuit 22 through the high frequency switches 24a and 24b.” (col. 10, lines 17 to 28)

In operation, the CPU alternately selects antenna 11a and 11b and makes intensity field intensity detection voltage measurements, with the voltage measurement for antenna 11b being used as a reference. The voltage measurement for antenna 11a is compared with that for antenna 11b (see the flow diagram of Figure 18). If the average voltage measured for antenna 11a is less than the average voltage measured for antenna 11b (step S25-1), the notifying operation is executed in step S26.

What is common to each of Mizoguchi's embodiments is that a measurement is made of antenna characteristics in order to detect touching of the antenna by the user. Also common to each of Mizoguchi's embodiments is that when such touching is detected, the user is notified by audible, visible or tactile means.

Mizoguchi's approach is quite different from the claimed invention. The claimed invention makes no measurements of the antenna characteristics, which are themselves only indirect indicators of touching by the user. Rather, the claimed invention provides separate sensors in proximity to the antenna, directly detecting a touching by the user. The claimed invention does not notify the user of a touching of the antenna, as does Mizoguchi. Rather, the claimed invention automatically switches to an alternate antenna which is not being touched by the user. This switching is completely automatic, and the user is never aware of it. The approach taken by the claimed invention is superior to that of Mizoguchi in that the circuitry is simpler, resulting in lower cost of manufacturer, and the user is never aware of the operation of the circuitry.

The Examiner states that “Mizoguchi does not *expressly disclose* that the second antenna is capable of transmission” (emphasis added). This is a distortion of what Mizoguchi discloses. The fact is that Mizoguchi expressly discloses that the second antenna is not capable of transmission. See col. 9, lines 66 and 67.

The Examiner relies on Werling et al. for a disclosure of a portable radio terminal device having a plurality of antennas. What Werling et al. disclose is means for avoiding the emission of radio waves in the direction of human tissue (column 1, lines 65 and 66), and this done altering the radiation pattern of a plurality of directional antennas. Figure 1 shows a radio communication apparatus 11 having an antenna structure with many directional antennas 12, 13, 14, and 14 that form a radiation pattern, as generally shown in Figure 2. Each antenna is connected to a power regulation device 16 controlled by a control element 17. A proximity detector 18 is connected to the control element 17 and detects the presence of human tissue in the proximity of the apparatus by measuring, for example, temperature or humidity.

“Such a detector is thus capable of differentiating between a human body featuring a certain coefficient and another body having a different coefficient. The value of this coefficient is analyzed by the control element 17 and compared to set values stored in, for example, the read-only memory to determine, in dependence on their preferred directions of transmission, which are the directional antennas whose transmit power is to be reduced and to trigger an appropriate control of the power regulation device 16.

“Under the control of the control element 17, the power regulation device 16 selects one or various antennas and adjusts their transmit power as a function of the data produced by the detector 18.” (column 3, lines 6 to 18).

“According to a preferred embodiment of the invention, the detection of human tissue by the proximity detector 39 triggers the control by the control element μC of the appropriate switches for deactivating the antennas whose radiation diagram points to the user's head. In the example with four antennas represented in FIG. 2, the antenna producing the lobe 27 will generally have to be deactivated.” (column 4, lines 4 to 10).

Thus, it is clear that Werling et al. solve a completely different problem than that of the disclosed and claimed invention and, for that matter, Mizoguchi. Werling et al. use a complex sensor device with stored coefficients to detect proximity of human flesh to an antenna and modifies the effective transmission antenna pattern of a plurality of directional antennas so as not to emit radio waves in the direction of human tissue. Note that the reception antenna pattern is not modified.

Claim 1 recites “A portable radio terminal device for radio communication by using an antenna *provided in a housing*” (emphasis added). The claimed portable radio terminal comprises “a first antenna *capable of transmission disposed in a lower part of the housing and a second antenna capable of transmission disposed in an upper part of the housing* for radio communication, *said first antenna and said second antenna being selectively switched for use*” (emphasis added). The claimed portable radio terminal further includes “a sensor for *sensing when the first antenna or the second antenna is covered* and outputting a detection signal” and “means for *switching between said first antenna and said second antenna for use based on said detection signal*” (emphasis added). It is clear, from a fair reading of the references, that the combination of Mizoguchi and Werling et al. do teach, suggest or otherwise make obvious the claimed invention.

Claims 9, 11, 12, and 15 were rejected under 35 U.S.C. §103(a) as being “anticipated [sic]” by the patent to Werling et al. in view of U.S. Patent No. 5,224,151 to Bowen et al. It is believed that the Examiner meant to use such words as “unpatentable over” or “obvious”, since “anticipation” is the subject of Section 102, not Section 103, of the Patent Statute. In any case, this rejection is also respectfully traversed for the reason that Werling et al. and Bowen et al., taken singly or in combination, neither show nor suggest the claimed invention.

Werling et al. is distinguished above. It is clear that Werling et al. recognize the problem solved by the claimed invention, much less suggest a solution to that problem. On the contrary, Werling et al. address a completely different problem, that of preventing radio wave emissions in the direction of a user’s head.

In making this rejection, the Examiner states that Werling et al. “does not *expressly disclose* an optical sensor”. Again, the Examiner is mischaracterizing the reference. In fact, Werling et al. disclose a very complex sensor which relies on stored coefficients. See column 3, lines 1 to 14, for example. In other words, Werling et al. disclose something entirely different than the claimed optical sensor.

The Examiner relies on Bowen et al. for a disclosure of an optical sensor in a personal communicator handset. What Bowen et al. disclose is a personal

communicator handset which is designed to operate as both a handset and as a speakerphone and to automatically switch between the two modes based on distance between the handset and the user's ear. This distance is determined by an infrared range detection unit built into the handset. The Examiner alleges that "it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Werling to use an optical sensor to detect human proximity so that harmful radiation may be directed away from said tissue, and for optimum antenna use to prevent degradation and prevent the unnecessary use of power that can be saved by using a more desirable antenna, and infrared being an inexpensive and widely used type of sensor." This run on statement appears to have nothing to do with the claimed invention but, rather, seems to be an effort to construct something that neither Werling et al. nor Bowen et al. contemplated. It is submitted that the Examiner's conclusions of obviousness as it pertains to the claimed invention are not supported by the references.

Bowen et al. address a problem which is totally different from that of either Werling et al. or the claimed invention. Bowen et al. do use an infrared sensor to detect relative proximity of the communicator handset to a user's ear and, if the communicator handset is moved a given distance, e.g., 1–2 feet, away, the mode of operation is switched to speakerphone. There is no such mode switching in either Werling et al. or the claimed invention.

Claim 9 recites "A portable radio terminal device comprising:
a plurality of transmission antennas separately provided;
a detector for detecting the deterioration of an antenna characteristic; and
a switch for switching, on the basis of the detected result, the operation from the deteriorated transmission antenna to a different transmission antenna,
and

wherein the detector is an optical sensor sensitive to light intensity change" (emphasis added). No such combination is suggested by the combination of Werling et al. and Bowen et al.

Claim 2 was rejected under 35 U.S.C. §103(a) as being unpatentable over the patents to Mizoguchi and Werling et al. further in view of U.S. Patent No. 5,905,467 to Narayanaswamy et al. This rejection is also respectfully traversed for

the reason that the combination of Mizoguchi, Werling et al. and Narayanaswamy et al. do not teach or suggest the claimed invention.

The patents to Mizoguchi and Werling et al. are distinguished above. Narayanaswamy et al. disclose a portable wireless device which use multiple antennas to provide antenna diversity in such devices. Antenna diversity is a form of redundancy in communication systems, and in the Narayanaswamy et al. reference, the purpose is to avoid dead or weak spots when using devices such as personal digital assistants (PDAs). A second antenna is placed in a moveable section that extends away from the main body of the device and, in the extended position, the second antenna is located at a spacing which is half a carrier wavelength from the main antenna. The Examiner alleges that “it would have been obvious to one of ordinary skill in the art at the time of the invention to have internal antennae in separate housing sections, to aid in antenna diversity for communication”. However, what is being claimed is not an antenna diversity system, nor do either of Werling et al. and Bowen et al. use a diversity antenna system.

Claim 6 was rejected under 35 U.S.C. §103(a) as being unpatentable over the patents to Mizoguchi and Werling et al. further in view of the patent to Bowen et al. This rejection is also respectfully traversed for the reason that the combination of Mizoguchi, Werling et al. and Bowen et al. do not teach or suggest the claimed invention.

In making this rejection, the Examiner alleges that “the combination of Mizoguchi and Werling discloses a radiotelephone according to claim 1, but does not *expressly disclose* and optical sensor” (emphasis added). First of all, it is clear from the foregoing discussion that the combination of Mizoguchi and Werling et al. does not disclose “a radiotelephone according to claim 1”, and secondly, the Examiner again mischaracterizes the references on the question of an optical sensor. There is in fact no such disclosure, express or implied, in the references. Bowen et al., also distinguished above, adds nothing to the combination of Mizoguchi and Werling et al. to suggest the claimed invention.

The Examiner is reminded of the basic considerations which apply to obviousness rejections as set out in MPEP 2141. Specifically, “When applying 35

U.S.C. 103, the following tenets of patent law must be adhered to:

- “(A) The claimed invention must be considered as a whole;
- “(B) The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination;
- “(C) The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention; and
- “(D) Reasonable expectation of success is the standard with which obviousness is determined.”

In the present case, the Examiner has wholly failed to follow these tenets of patent law. The Examiner has not considered the claimed invention as a whole. This consideration requires an understanding and appreciation of the problem solved by the applicant, the claimed structure which solves that problem, and the advantages achieved by the claimed structure. The Examiner has failed to consider the references as a whole and the desirability of combining those references. Rather, the Examiner has engaged in unsupported hypotheses, not suggested by any of the references, as to why they might be combined. This was done without regard to what the references themselves disclosed. In sort, the Examiner has engaged in impermissible hindsight by taking, out of context, bits and pieces of diverse references and attempting to reconstruct those bits and pieces to somehow resemble the claimed invention. Finally, the Examiner has failed to demonstrate how the proposed combinations of references would achieve any modicum of success.

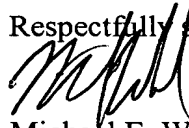
In view of the foregoing, it is respectfully requested that the application be reconsidered, that claims 1 to 3, 5 to 12, 14, and 15 be allowed, and that the application be passed to issue.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

A provisional petition is hereby made for any extension of time necessary for the continued pendency during the life of this application. Please charge any fees for such provisional petition and any deficiencies in fees and credit any

overpayment of fees to Attorney's Deposit Account No. 50-2041.

Respectfully submitted,



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